

CLAIMS

[CLAIM 1]

- A synchronous rectification mode DC-to-DC converter power supply
5 device, comprising:
- a first switching power supply means; and
 - a second switching power supply means for carrying out synchronous rectification based on a drive pulse of the first switching power supply means, wherein
- 10 the first switching power supply means comprises:
- an oscillation control means operating by a DC input power supply and outputting a drive pulse;
 - a first drive means for outputting a drive waveform based on the drive pulse from the oscillation control means;
- 15 a first switching element being driven by the output of the first drive means;
- a first rectifying means having a positive electrode being grounded and a negative electrode being connected to the output of the first switching element; and
- 20 a first coil being connected to the output of the first switching element; and
- the second switching power supply means comprises:
- a second drive means for outputting a drive waveform based on the drive pulse from the oscillation control means;
- 25 a second switching element being driven by the output of the second drive means;
- a second rectifying means having a positive electrode being ground

and a negative electrode being connected to the output of the second switching element;

a third switching element being connected in parallel to the second rectifying means and driven by the output of the first drive means; and

5 a second coil being connected to the output of the second switching element.

[CLAIM 2]

The synchronous rectification mode DC-to-DC converter power supply device according to claim 1, wherein an OFF period of the second switching
10 element includes an OFF period of the first switching element.

[CLAIM 3]

The synchronous rectification mode DC-to-DC converter power supply device according to claim 1, further comprising a third switching power supply means for carrying out synchronous rectification based on the drive pulse of the
15 second switching power supply means, wherein

the third switching power supply means comprises:

a third drive means for outputting a drive waveform based on the drive pulse from the oscillation control means;

20 a fourth switching element driven by the output of the third drive means;

a third rectifying means having a positive electrode being grounded and a negative electrode being connected to the output of the fourth switching element;

25 a fifth switching element being connected in parallel to the third rectifying means and being driven by the output of the second drive means; and

a third coil connected to an output of the fourth switching element.

[CLAIM 4]

The synchronous rectification mode DC-to-DC converter power supply device according to claim 3, wherein an OFF period of the second switching element includes an OFF period of the first switching element, and an OFF period of the third switching element includes an OFF period of the second
5 switching element.

[CLAIM 5]

The synchronous rectification mode DC-to-DC converter power supply device according to claim 1, further comprising a sixth switching element being connected in parallel to the first rectifying means and driven by the output of
10 the oscillation control means.